

REMARKS

In the first Office Action, the Examiner rejected claims 1-4, 7, 9, 11, and 13 under 35 USC §102(b) as being anticipated by US 5,354,983 to Juds et al. The Examiner objected to claim 18 for an informality and rejected claim 18 under 35 USC §102(b) as being anticipated by US 4,926,170 to Beggs et al. The Examiner rejected claims 5 and 17 under 35 USC §103(a) as being unpatentable over Juds et al. in view of US 5,485,155 to Hibino. Claims 6, 8, 10, 12, and 14 were rejected under 35 USC §103(a) as being unpatentable over Juds et al in view of US 2003/0222772 to Laufer. Claims 15 and 16 were rejected under 35 USC §103(a) as being unpatentable over Juds et al in view of JP 05297141 to Azusazawa et al.

Applicant has amended claim 18 to address the Examiner's objection relative to an informality. Claims 1-18 are currently pending in this application. Reconsideration and re-examination of the application as amended is respectfully requested.

Rejection Under 35 USC §102(b)

The Examiner rejected claims 1-4, 7, 9, 11 and 13 as being anticipated by US 5,354,983 to Juds et al. and claim 18 as being anticipated by US 4,926,170 to Beggs et al. Applicants respectfully disagree and traverse the Examiner's rejection.

Juds et al. '983. As described in the specification and recited in independent claims 1, 11, 13, and 18, Applicants' invention includes systems and methods for detecting an object that emit one or more light pulses, receive a reflection of the emitted pulse(es) and adjust sensitivity based on the elapsed time after emission or elapsed time between emission of the pulse(es) and receiving of the reflection(s). By adjusting the sensitivity as disclosed and claimed, Applicants' invention can detect objects at relatively large distances while also detecting objects through fog. US 5,354,983 to Juds et al. does not disclose or suggest adjusting sensitivity based on time as disclosed and claimed by Applicants.

In contrast to Applicants' claimed invention, Juds et al. '983 discloses a strategy for detecting objects through fog or other particulates using a fundamentally different approach based on the distance of the detector(s) from the emitter. The sensitivity of different detectors may be different (in terms of amplitude (gain) and polarity), but is illustrated and described as being constant for a particular detector. For example, as shown in Figures 7

and 14 of Juds et al. '983, a first detector 46,180 has a negative polarity and a first constant sensitivity. A second detector 48, 182, positioned farther away from the emitter than the first detector, has a positive polarity and a second constant sensitivity. A third detector 132, 184 has a positive polarity and a third constant sensitivity. The sensitivity of the detectors does not change based on elapsed time as disclosed and claimed by Applicants.

The "relative sensitivity" or effective sensitivity as illustrated in Figs. 8 and 15 of Juds et al. '983 represents the mathematical convolution of the intensity of a reflected pulse (which varies based on the distance of the object that reflects the pulse relative to the emitter and detector) and the detector sensitivities illustrated in Figs. 7 and 14, respectively. These Figures and related description do not disclose changing sensitivity based on elapsed time as disclosed and claimed by Applicants. The "relative sensitivity" is the effect of a varying intensity in combination with the positive and negative polarities and the different sensitivities of the detectors and does not illustrate a system or method that vary the sensitivity of a particular detector.

Likewise, contrary to the Examiner's characterization, Fig. 9 of Juds et al. '983 illustrates the effective or "excess gain" of the system that is produced by multiplying the relative sensitivity of Fig 8 by the intensity function (which varies based on the distance of the object that reflects the pulse as described above). The graphs of Figures 8 and 9 do not illustrate any type of control, function, or signal that is applied to, or characteristic of, the detector(s). Rather, they illustrate the result of positioning detectors at some predetermined distance from the emitter and assigning a polarity/sensitivity to each detector as illustrated in Fig. 7.

As described above, Juds et al. '983 does not disclose adjusting or varying sensitivity based on elapsed time as disclosed and claimed by Applicants. Rather, Juds et al. discloses different sensitivities (and polarities) for different detectors. Furthermore, Juds et al. does not disclose adjusting sensitivity by adjusting a threshold or by adjusting the gain of the detector as disclosed and claimed by Applicants. In fact, Juds et al. teaches the opposite: "Since the overall gain of the object detector 10 is usually increased in order to detect dark-colored objects, the reflections from objects 16 is made even more effective in causing the generation of the detection signal" (Col 4, ll. 43-47) Juds et al. clearly does not teach changing the gain based on an elapsed time as disclosed and claimed by

Applicants. Likewise, Juds et al. states "The use of a single large detector does not allow for this sculpturing or decrease in Excess Gain at relatively close ranges to object detector 10 and an increase of gain thereafter within the detection range defined as 157" (Col 9, ll. 39-43). This is because Juds et al. teaches different sensitivities for different detectors based on the position of the detector relative to the emitter (which, in combination with opposite polarity, results in an excess gain that changes based on the distance of the detector relative to the emitter), not adjusting the sensitivity (by adjusting the gain or threshold) based on time as disclosed and claimed by Applicants.

Beggs et al. '170. The Examiner rejected claim 18 as being anticipated by Beggs et al. '170. Applicants respectfully disagree and traverse the Examiner's rejection.

Claim 18 is directed to an article of manufacture that includes code for adjusting sensitivity for detecting the object based on elapsed time from the emission. Beggs et al. is directed primarily to a hardware implementation of a detection apparatus. Although Beggs et al. mentions in passing that the functions of controller 26 may be implemented in software or hardware, there is no disclosure of implementing other blocks or functions in software or code as disclosed and claimed by Applicants. Furthermore, there is no disclosure in Beggs et al. of adjusting sensitivity based on elapsed time as disclosed and claimed by Applicants, whether performed by hardware or software. The Examiner relies on col. 5, ll. 57-68 and col. 9, ll. 29-58 as anticipating this feature of Applicants' invention. Beggs et al. discloses that "threshold pots 36 effectively provide a means for adjusting the sensitivity of the detection system, and thus the range or distance that the detection units 18 are effective to detect the object 24." There is no disclosure of providing code to adjust the sensitivity and no disclosure of adjusting the sensitivity (using pots or otherwise) based on elapsed time as disclosed and claimed by Applicants. Likewise, Beggs et al. discloses use of a quadrature (phase delayed) signal to discriminate between ambient light sources or reflections and those generated by the emitter. There is no disclosure of code for adjusting sensitivity based on elapsed time as disclosed and claimed by Applicants.

For the reasons stated above, Applicants respectfully submit that Applicants' claimed invention includes a number of patentable features that are neither disclosed nor suggested by Juds et al. '983 or Beggs et al. '170.

Applicants' respectfully request the Examiner to withdraw the rejection under 35 USC §102 of claims 1-4, 7, 9, 11, 13, and 18.

Rejections Under 35 U.S.C. §103(a)

The Examiner rejected claims 5, 6, 8, 10, 12, and 14- 17 under 35 USC §103(a) as being unpatentable over the primary reference of Juds et al. in combination with secondary references US 5,485,155 to Hibino, US 2003/0222772 to Laufer, and JP 05297141 to Azusazawa et al. Applicants respectfully disagree and traverse the Examiner's rejections.

As stated above and incorporated here by reference, the primary reference of Juds et al. fails to disclose adjusting sensitivity based on time as disclosed and claimed by Applicants. Because the Examiner relies on Juds et al. as the primary reference in each of the obviousness rejections, and Juds et al. fails to disclose or suggest this feature, the proposed combinations fail to teach or suggest all the features of Applicant's claimed invention and the rejection should be withdrawn.

In addition, Juds et al. teaches away from adjusting the sensitivity based on time as taught by Applicants as evidenced by the disclosure of Juds et al. in Col. 4 relative to increasing overall gain to detect dark objects and the disclosure in Col. 9 relative to being unable to use a single detector to produce an increased or decreased "excess gain" for objects closer or farther from the detector (because Juds relies on multiple detectors with different sensitivities or an optical filter or mask to create different sensitivities for different detectors or areas of a detector). As such, the proposed combinations are improper in that there is no motivation to combine features as proposed by the Examiner.

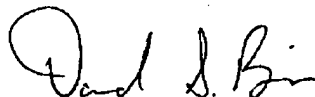
For the reasons above, Applicants respectfully submit that the invention as claimed is patentable over the prior art applied by the Examiner and the rejections under 35 USC §103 should be withdrawn.

Summary

Applicants have made a genuine effort to respond to each of the Examiner's rejections and objections to advance the prosecution of this case. Applicants respectfully submit that all formal and substantive requirements for patentability have been met and that this case is in condition for allowance, which action is respectfully requested. If any further amendment is necessary to advance prosecution and place this case in allowable condition, the Examiner is courteously requested to contact the undersigned by fax or telephone at the number listed below.

No additional fee is believed to be due based on the filing of this response. However, please charge or credit any fee deemed necessary for the filing of this Amendment to Deposit Account 06-1510 (Ford Global Technologies, LLC). If there are insufficient funds in this account, please charge the fees to Deposit Account No.06-1505.

Respectfully submitted,



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Filed Under Rule 34(a)

Date: February 27, 2004

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